

Date: Tue, 1 Nov 94 04:30:26 PST
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>
Errors-To: Ham-Ant-Errors@UCSD.Edu
Reply-To: Ham-Ant@UCSD.Edu
Precedence: List
Subject: Ham-Ant Digest V94 #362
To: Ham-Ant

Today's Topics:

2 meter HT on Snowmobile help!
50 Ohms Why ? (2 msgs)
Best vertical - Butternut?
BNC vs N vs UHF at VHF/UHF frequencies
HARDLINE...which one!?
Wanted! Measurements for 220 J-Pole
What's a good antenna for a Dorm Room?
x-beam vs yagi, ELNEC

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

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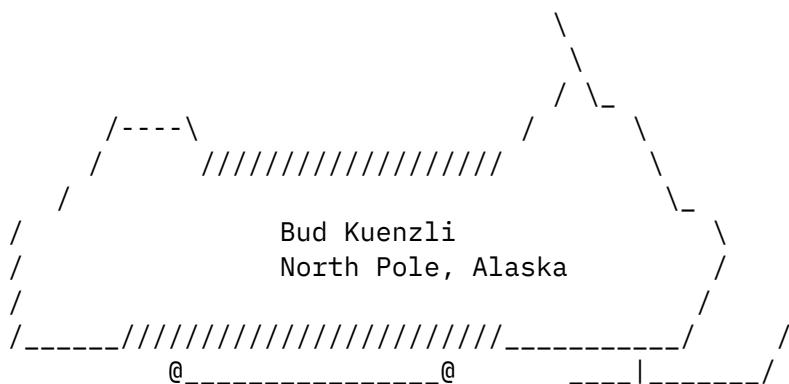
We trust that readers are intelligent enough to realize that all text herein consists of personal comments and does not represent the official policies or positions of any party. Your mileage may vary. So there.

Date: 1 Nov 94 14:45:51 GMT
From: lthfbjk@northstar.k12.ak.US (Bud Kuenzli)
Subject: 2 meter HT on Snowmobile help!

Okay, here is the plan....my wife and I are buying a Kenwood 22AT 2 meter for communication between us and for emergency use while we are snowmobiling. While we are riding in the area and talking back and forth (we live in North Pole Alaska) the rubber ducky will be just fine, but there may be a time when we need to hit a repeater at a distance so I am trying to learn what antenna I might add to extend my range. Would a simple 1/2 wave telescoping antenna be as good as anything we might add to the snowmobile itself? If I was to add an antenna to the snowmobile it would either have to be strong or flexible enough so that it would "bend with the wind" when we pass under a tree branch, or it would need some kind of flexible attachment, or both. It might be something that we could extend,

leaving it "folded" in normal use. I have thought about a 1/2 dipole but we could be on the tundra with no tree to hang it between...

As I said, for daily transmission we are find, but if I drive off a glacier, I'd like my wife to get that added ooomph of a better antenna. I have an electric start machine so I'll rig my hand held to run off the 12 volt battery eventually. I'd imagine I could rig my wife's to run off her alternator....?? Any ideas with regard to type and attachment of other antennas or schemes to increase our range would be appreciated. Thanks in advance!



Date: 31 Oct 1994 08:39:51 -0800

From: rdcole@crl.com (Ron Cole)

Subject: 50 Ohms Why ?

Alastair "J." Downs (ee17@csu.napier.ac.uk) wrote:

: This has probably been asked before (but at least it may have been clarified)

: Why choose 50 ohms as the stanard characteristic impedance for RF kit ?

Here's how it was explained to me. Back many years ago standard sizes of copper water pipe were used to make coax. A combination of two sizes. Inner and outhter conductors yeilded a 51 ohm impeadnace. That be default becam the impeadnace used. No how the 300 or 450 ohm open lines od even some of the comercial stuff like 270 ohm open line.

I know their has to be a better explination but thaths what an Old Radio engineer told me. Hey we was building 50Kw AM's over 60 years ago so how am I to argue.

Ron Cole
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Date: Fri, 28 Oct 1994 22:38:19 GMT
From: tomb@lsid.hp.com (Tom Bruhns)
Subject: 50 Ohms Why ?

Bob Hale (hale@btree.brooktree.com) wrote:
: In article <CyE0nA.BB4@ncifcrf.gov>, Joe Mack <mack@ncifcrf.gov> wrote:
: >In article <6809.9410281220@csu.napier.ac.uk> ee17@csu.napier.ac.uk (Alastair
"J." Downs) writes:
: >>Why choose 50 ohms as the standard characteristic impedance for RF kit ?
: >
: >It's a compromise. The minimum attenuation occurs at 70ohms (which is
: >presumably why cable TV companies here use 70ohm cable), the maximum
: >power handling is at (I think) 37ohms and so 50ohms is about in the
: >middle.

: Correct. But the coax which produces these results is air-dielectric
: copper coax, not the plastic insulated stuff that most of us use. If
: you try to find the minimum loss or maximum power handling impedances
: for plastic insulated coax you will find that you need to know the
: operating frequency because the dielectric's behavior changes so much
: with frequency.

Fred Terman published in "Radio Engineers' Handbook" a pretty early discussion of this. For frequencies below about 1GHz, the dielectric loss is negligible, but insulation causes you to have to use a smaller inner conductor for a given outer conductor and impedance, and therefore you get higher losses-- but the ratio of inner conductor diameter to outer conductor diameter remains constant for the minimum loss configuration. The result is about 77 ohms for air insulation, down to about 51 ohms for solid polyethelene dielectric. Solid Teflon is just a bit higher, about 52 ohms as I recall. Foam is between the two; in fact, it will be 77 times the propagation factor (velocity factor) for the line. Also, if the inner and outer conductors are different materials, then the min occurs at a different diameter ratio; someone suggested that aluminum-jacketed foam-insulated line with a copper center conductor likely is min loss near a 75 ohm configuration.

Quoting from Terman about max power:

"The power that can be transmitted for a given maximum voltage gradient in a concentric line [coax] having an outer conductor diameter D is a maximum when $D/d = 1.65$, corresponding to $Z_0 = 30$ ohms."

I'd note that this is for air-insulated line, and if the dielectric is

uniform, the same D/d should hold for other dielectrics. I'd also note that for CW operation at HF and above with a 1:1 SWR, you will probably reach the thermal limit for the line long before you reach the voltage limit. RG-213/U is rated at 5000 volts, and that would be half a million watts at 50 ohms. You'd melt the line in short order at that power. It's a useful rating for pulse applications, but not for CW. (Let's see, if you had 5MW, 1dB/100ft, that would be 100kW/100 feet or 1000 watts per foot...No, I don't want to be close by when you try that one!)

In any event, the min attenuation thing is a rather broad minimum. I think the answer really comes down to "a lot of practical loads like resonant antennas are in the vicinity of 50 ohm loads, and the dimensions of the line are practical." Some engineers quite a while ago made an engineering choice which has been good enough that there hasn't been any serious effort to change it. In fact, the 75 ohm standard for TV and video stuff might be more interesting. Someone apparently saw fit to buck the 50 ohm standard on that. Anything to do with the ease of going from a 300 ohm folded dipole to 75 ohms with a balun?

73, K7ITM

Date: 31 Oct 1994 16:19:41 GMT
From: ignacy@misz.animal.uiuc.edu (Ignacy Misztal)
Subject: Best vertical - Butternut?

I am in a process of selecting a vertical. My 2x40ft dipole at 25ft fed by a ladderline works all band with a tuner but performance isn't good except on 40m.

I would prefer a vertical with a 10-40m coverage, 80m being a bonus. Since there is some room for radials, I don't consider expensive R7 particularly because of its narrow bandwidth on 20 and 40m.

One of the choices is Butternut HF6V. It is light, its mass is concentrated in the lower section so as to present a low windload, and its coils are large. Did anybody compare HF6V to any other vertical (or anything else)? Can anyone recommend anything else

One choice of a home made vertical could be a dipole with one part being a vertical pole and the other part horizontal (or sloping). It could be multiband too. Anybody tried to do it? perhaps one problem with it would be a lack of symmetry.

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Date: Sun, 30 Oct 1994 00:22:50 GMT
From: alanb@hpnmarb.sr.hp.com (Alan Bloom)
Subject: BNC vs N vs UHF at VHF/UHF frequencies

Jeff DePolo (depolo@blue.seas.upenn.edu) wrote:

..
: All of the tests were done on the 440 MHz band. ...
:
: I fould that the patch cables that used either N or BNC connectors,
: including the one BNC right-angle connector, had no measurable effect on
: loss or SWR at 440 MHz. ...
:
: The UHF connectors are another story. With the Amphenol phenolic
: UHF connector in place, SWR was calculated at 1.46:1, and the
: *measured* loss was approximately 0.3 dB. Note that the measured loss
: value doesn't match what the calculated loss should be (see the
: last paragraph as to why).

If the insertion loss were from reflection (impedance mismatch) only, then the loss would be .16 dB. Evidently the phenolic not only upsets the 50-ohm match but also absorbs some of the power. Interesting.

: So what did I learn from all of this? Well, nothing new really.
: It reaffirmed the age-old caveat to stay away from UHF
: connectors on VHF/UHF frequencies.

Not sure I agree about the VHF part. The worst connector you could find lost only .3 dB at 450 MHz. I bet it wouldn't be more than .1 dB on the two meter band, which I think most hams would find acceptable. And good-quality connectors do better than that.

AL N1AL

Date: Mon, 31 Oct 1994 07:33:28 -0500 (EST)
From: Mike Fletcher <fletcher@gate.net>
Subject: HARDLINE...which one!?

On 30 Oct 1994, David M. Roseman wrote:

> ok, now i know there are TWO types of hardline coax...
> basic CATV stuff, and radio stuff.
> but can i use the CATV type with out any major drawbacks?

> cause it's easier to get FREE, CATV then radio type...so...
> which is it!?
>
>
>
> thanks
>
> DAvid
> |-----|
> | David Roseman | c002@lehigh.edu |
> | SysOp of NODE 3 BBS | The Flying HAm - BBS |
> | Running OBV/2 Software | KBR-9318 - CB |
> | | N3SQE/SVARC - Ham |
> | HAmmy in IRC | N3SQE@N3IJD.FN20GO.PA.USA.NA - Packet |
> |-----|
>
>
David,

If you are discussing the commercial CATV cable types ie. the distribution cable that they hang on poles etc. which is generally 1/2 to 3/4 inch diameter cable with a solid aluminum sheath and a center conductor surrounded by foam, then you have no problem. A couple of people make coupling transformers to use the 75 ohm CATV cable with 50 ohm Radio systems. I don't have a name handy but check QST, CQ etc, or the local hamfest and you can probably find them. If you were discussing small indoor 75 ohm cable I dont think the cost of the couplers would be worth it, probably cheaper to buy RG58.. Hope this helps...

73 De AD4HV Mike Fletcher
fletcher@gate.net

Date: Mon, 31 Oct 1994 01:39:19 -0700
From: fitz@esl.com (Jim Fitzharris)
Subject: Wanted! Measurements for 220 J-Pole

Does anyone out there have the measurements, formula, or plans for building a 220Mhz J-pole? Any info. would be greatly appreciated.

Thank you for your time.
73's
Sean KE6MOW

Date: Sun, 30 Oct 1994 15:55:00 GMT
From: clint.bradford@ectech.com (Clint Bradford)

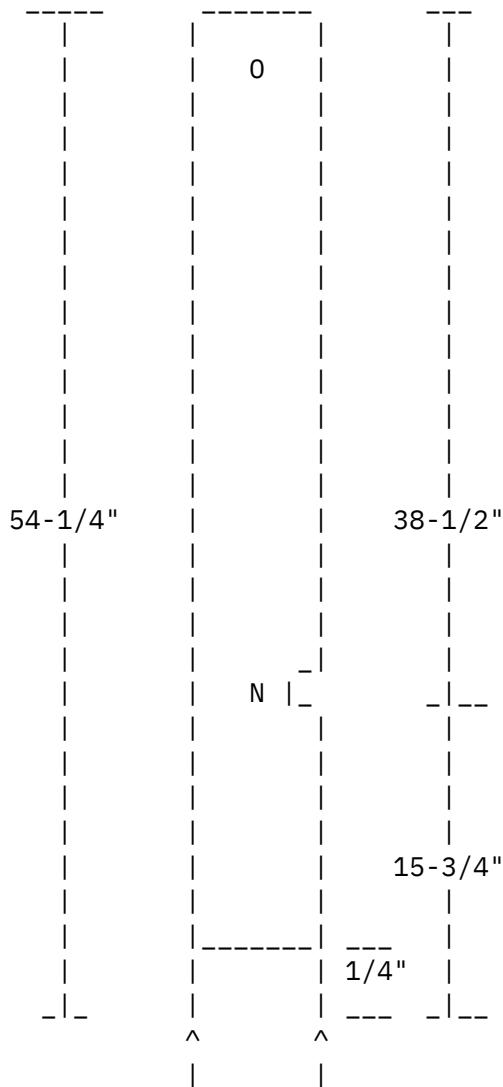
Subject: What's a good antenna for a Dorm Room?

C>Path: planet!isdnlin.mtsu.edu!darwin.sura.net!math.ohio-state.edu!news3.acns.
>From: cmatthew@wpo.uwsuper.edu (CHARLES R. MATTHEW)
>Newsgroups: rec.radio.amateur.antenna
>Subject: What's a good antenna for a Dorm Room?

C> Charlie N0FXD here, Looking for suggestions of antennas types that
>would work good in a college dorm room (we like to call it a residence
>hall). I work on 2m FM/Packet and 10 SSB/CW. All replies welcome!

2M J-Poles are easy, cheap, and they WORK!!!

==== 2m/70cm Dual Band J-Pole made from 300 ohm twin lead ===



Coax	Inner	Coax	Outer
Conductor		Conductor	

SWR is 2:1 across the 2m band and from 435mhz to 450mhz on the 70cm band.

1. Use good quality TV twin lead.
2. Strip insulation at the solder point for coax feedline.
3. Cut out and remove the 1/2" long notch N.
4. Feed with a length of 50 ohm coax and terminate with the appropriate connector. Tape coax at feedpoint to the twin lead, or use heat shrink, and make sure the joints are insulated from each other.
5. Antenna may be sleeved inside 1/2" PVC for outside mounting or hung on a loop of string run thru hole 0.

* QMPro 1.53 * Thesaurus: ancient reptile with an excellent vocabulary.

Date: 31 Oct 94 16:58:06 GMT
From: harper@huntsville.sparta.COM (Christie Harper)
Subject: x-beam vs yagi, ELNEC

I am looking a building a small antenna for 29.39 Mhz (RS-10 downlink) and was doing a little modeling with ELNEC comparing a 2 element yagi vs an X-Beam antenna. Not having any practical experience with X-beams I was wondering if anyone knew what the pattern should look like and what kind of performance w.r.t a 2 element yagi should be. According to ELNEC I think I will go with the 2 element yagi.

Is there any interest in this group of posting to a common site (any suggestions) ELNEC input files?

Has anyone written or would be interested in tools to generate ELNEC input files for some standard types of antennas (K1FO yagis, Quads,...)?

end

the views expressed here are the author's

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"we have met the enemy and he is us." w. kelly

End of Ham-Ant Digest V94 #362
